teachers. Animals are discussed in order to throw light on the biology of human life, in order to help towards healthy living. Everyday functions get a prominent place; bees, mosquitoes, and flies come to the front; the discussion of birds and fishes leads on to the question of their conservation; the Protozoa are used to illumine man's cellular processes; bacteria receive much attention. Precise practical work is, of course, insisted on as a discipline, and many of the conventional tasks are included. But there are as many which have a fresh practical turn.

The lessons on everyday hygiene, on foods, and on the use of alcohol and tobacco seem to us very sound, and, in short, what we like about the whole book is its persistent endeavour to bring the biological instruction into direct touch with human life. There is no risk that the study of pure science will be in this way endangered, and there is every likelihood that the education of the young citizen will be immensely improved. The book is generously provided with interesting illustrations, many of them photographs.

For future editions we would make the suggestion that the authors do not attempt to cover quite so much ground. Thus the paragraph on the relatives of the earthworm would be much better deleted unless more can be said, and there are many other cases where this book would be improved by recognising the necessity for others. We should like to express our appreciation of the wholesome view that "no study of human biology should be allowed to leave in the mind of the student the idea that he is merely a chemical engine adapted only for the generation of a certain amount of physical energy."

(2) Miss Lulham is to be congratulated on the success of her "Introduction to Zoology," which fills a distinct gap. It introduces the student to the study of living creatures (Invertebrates only) with habits and habitats and interrelations, and it has been written from experience. It abounds in valuable practical hints. There is a convincing reality about the book, and a real feeling of the open air, two qualities which are enhanced by the unusually skilful and spirited figures which have been prepared by Miss Violet Sheffield. This introduction should be of great value to teachers of nature-study, to students working alone, and to those who wish to supplement their more analytic and anatomical work by some sound œcology.

Miss Lulham deals excellently with earthworm and starfish, pond-snail and prawn, but she is at her best when she comes to spiders and insects—to which much more than half the book is devoted. It will be a good thing for the study of natural history if this exceedingly educative "Introduction to Zoology" comes into widespread use, as it certainly ought to do. For it is unusually true to its excellent motto:—

Ἐν πᾶσι γὰρ τοῖς φυσικοῖς ἔνεστί τι θαυμαστόν.

(3) Prof. Bigelow's manual is really a sort of teacher's appendix to accompany "Applied Biology" and "Introduction to Biology," by Anna N. Bigelow and himself. He gives useful hints as to the best way of using the "Applied Biology" (without which this manual is of relatively little use), and advice in regard to material for practical work, methods, equipment, and literature. The orientation of the biological studies in relation to human life is a prominent feature in Prof. Bigelow's plan of instruction, and he is emphatic in regard to the indispensableness of the biological foundation. In regard to sex-hygiene, for instance, he says: "The most practicable step now possible in the world-wide movement for sex-education is the development of the full possibilities of the biological studies that touch the problems of reproduction."

(4) Prof. R. Hertwig's "Zoology" has passed through nine German editions and continues to be a favourite manual. It gives a general introduction to morphology and physiology and a systematic treatment of the various phyla, with special attention to particular types. Its virtues are general trustworthiness, clearness, and a judicious selection of essentials. Its deliberate defects are that it is too much pemmican and not very interesting, and that it says very little about the life of animals. Prof. Kingsley has prepared a revised American edition, especially adapted for American needs. It is to a considerable extent a new book, and it is a competent piece of work sure to be of great utility. It has been very carefully edited, and it includes not a few original figures. We cannot profess, however, to have any belief in the usefulness of the summaries of important facts given at the end of each phylum; many of the propositions are too terse to be true, and altogether they smack of the cram-book.

J. A. T.

OUR BOOKSHELF.

Ueber einfache Pflanzenbasen und ihre Beziehungen zum Aufbau der Eiweissstoffe und Lecithine. By Dr. G. Trier. Pp. iv+117. (Berlin: Gebrüder Borntraeger, 1912.) Price 5·60 marks.

THIS work is a valuable contribution to plant chemistry by a well-known worker who, by his own researches, has considerably enlarged our knowledge in this special domain. He has found it possible to give a summary of recent work and theoretical views of a complex character which is extremely interesting but might easily have

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been made a very dull affair. After briefly formulating the simple bases and amino-acids occurring in plants, the author proceeds to discuss their relationships and the probable way in which they are actually built up in the plant. He develops a simple hypothesis by which amino-ethyl alcohol (which he himself recently isolated as a product of the hydrolysis of lecithin) and amino-acetic acid are formed from glycol and glycollic acid, and regards these substances as the simple bricks from which the complex lecithins and proteins are built up.

In this synthesis the primary stage is a Cannizzaro transformation of glycollic aldehyde to the corresponding alcohol and acid, which the author regards as effected by an enzyme mutase, citing evidence in support of this view. It may, however, be suggested that this action is a direct effect of light, as in the case of many similar changes recently studied. Some of the author's views as to the manner in which complex alkaloids, for example laudanosine in the *iso*quinoline group, are built up from a single aromatic amino-acid are ingenious and very probable. Interesting chapters in the work deal with such questions as the biological significance of the betaïnes, the occurrence of methylation in the plant, the nature of the phosphatides and lecithins and the synthesis of the purine bases within the plant.

Some of the author's remarks on p. 70 with reference to the non-production of nicotinic acid in nature would appear to need modification owing to the discovery, since the work was published, by Suzuki and Matsunaga of this acid in rice-bran; this acid has great significance as derived from a β amino-acid.

The work would be greatly improved by equipping it with an index. W. A. D.

La Sécrétion Pancréatique. By Emile F. Terroine. Pp. 133. (Paris: A. Hermann et Fils, 1913.) Price 5 francs.

THIS little book on the pancreas forms one of a series of biological monographs which are appearing under the direction of Prof. Dastre, of the Sorbonne. The first chapters treat the subject historically, and show by what slow steps the early knowledge of this important organ was obtained, and the important character of Claude Bernard's pioneer work.

The bulk of the book is, however, taken up with a discussion of modern views, which were initiated by Pawloff and elucidated by the great discovery made by Bayliss and Starling of the part played by a chemical stimulus in stirring up the organ to activity. This material, called secretin, is formed in the intestine, and reaches the pancreas by the blood-stream; so that the mechanism may be described as a "humoral reflex" as against the nervous reflex which was formerly supposed to exist. Secretin is not the only chemical messenger in the body; physiologists now are acquainted with a considerable number of these "hormones," and their discovery has created a great revolution in our conceptions of physiological and pathological processes.

What secretin is chemically is not yet known; the culmination of the work in the unravelling of its composition is reserved for the future.

The pancreas is full of interest because it also possesses an internal secretion, but that aspect of the subject is not treated in the present volume.

Dr. Terroine's book is to be thoroughly recommended to all who desire a clear account of recent progress and present doctrines concerning pancreatic activity. W. D. H.

The Posture of School Children: with its Home Hygiene and New Efficiency Methods for School Training. By Jessie H. Bancroft. Pp. xii+327. (New York: The Macmillan Co., 1913.) Price 6*s.* 6*d.* net.

IT is beginning to be understood by parents and teachers that the complete education of children includes physical as well as mental training. The schools now no longer ignore the bodies of the pupils, but by medical inspection, graded physical exercises, which are remedial when necessary, and by careful sanitation, every effort is being made to make the children healthy in body as well as well trained mentally. In this useful undertaking doctors and teachers are cooperating, and one of the evidences of this joint endeavour is the appearance of numerous books intended to provide teachers with scientific and technical knowledge in an attractive form. The present volume is by the assistant-director of physical training in the public schools of New York City, and gives teachers guidance as to how to correct poor posture in the class-room, to prevent the various forms of curvature, and generally to assist normal growth.

Weather Signs and How to Read them. For Use at Sea. By W. Allingham. Pp. v+117. (Glasgow: James Brown and Son, 1912.) Price 2*s.* net.

THE author states that this booklet is a compilation written as an aid to the rising generation of mariners. Considered from this viewpoint we have no hesitation in saying that it will be found interesting and useful. Weather is closely connected with barometric pressure, air and sea temperature, state of sky, &c.; but the predominant factor is pressure. Several chapters are devoted to these subjects and to the construction and use of synoptic and synchronous weather charts; the advantage to sailors of charts of monthly average barometric values is referred to specially. The author makes it quite clear that he holds decided opinions on several subjects, some of which differ from generally accepted views, *e.g.* in the chapter dealing with cloud forms and signs he considers it difficult to accept as a working hypothesis the supposed connection between clouds and dust particles, at least many leagues from land. He also urges simplification in cloud nomenclature, "for under the present involved divisions clouds are doubtless as often described erroneously as they are correctly." The supposed influence of the moon on weather is justly ridiculed, and the work is brought up to date by useful details of the advantages derived from radio-telegraphy.

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